

How do I?

An occasional series

This week: FM VHF Some notes on navigating the tower of Babel:
IRLP and ECHOLINK

I was talking to a newly licensed ham. He is new to the wonderful world of amateur radio, but has clearly done his homework. He was using **CHIRP** (a free and popular radio and scanner programming software package) <https://chirp.danplanet.com/projects/chirp/wiki/Home> to program his Baefong handheld (HT) radio. CHIRP gives you the ability to search by county for licensed repeaters and once selected, will download the frequencies, and other settings) from Repeaterbook or one of the other options in CHIRP. It sounds pretty convenient but the next question was %some of them say DMR or DSTAR or FUSION. What does that mean?

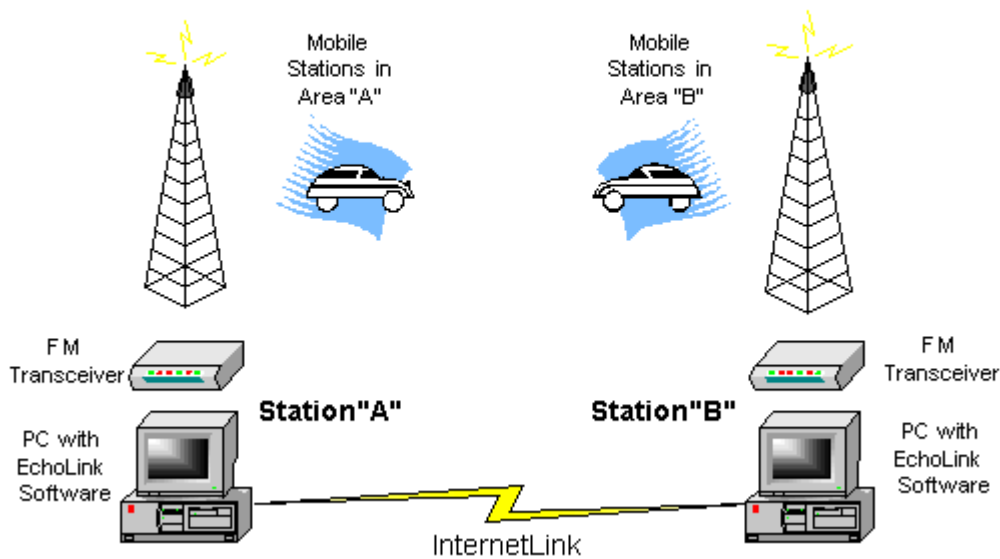
What follows is a very, very simple description of each. For more info, *Radios to Go! Getting the Most from Your Handheld Transceiver* by Steve Ford, WB8IMY is a great start for those seeking more detailed information.

This was going to be a one part article, but I realized it is complicated enough it will need several parts, so today is a very, very brief history of FM on 2 meters, and a short intro to repeaters and **IRLP** and **Echolink**

FM (Frequency Modulated) radios entered the amateur sphere after WWII using mostly ex-military Motorola gear. VHF (50 to 300 MHz) is generally thought of as line of sight. And many seem to think that if you want to talk to someone on VHF, and you cannot reach out and touch them, you must use a repeater. A repeater is a radio(s) connected to a controller. You, using your radio, call on the INPUT Frequency for example 147.820 and the repeater will rebroadcast your transmission on the OUTPUT frequency. For example 147.120. There are Repeater Coordinators nationwide who work together to make sure that repeaters do not interfere with each other. For more on how repeaters work see (**FM VHF using Repeaters** elsewhere on the Know-How Resources page). FM Simplex (only 1 frequency) works well and you may be surprised at how far you can actually communicate without a repeater. **FM Analog** whether using simplex or a repeater is 2 meter radio at its simplest.

Most repeaters are solo and have a coverage area a few miles in diameter. Some repeaters are linked or daisy-chained-where a series of repeaters is placed close together and if you call the input frequency, in central PA, a ham in southern NJ may hear the call, and come back to you. Both of you clearly hear each other, even though you are over 100 miles apart and could well have thought you were both using the same repeater.

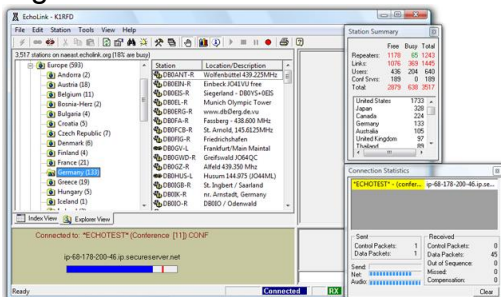
Linking Example



The above diagram is from the Echolink website. The link from A to B is by radio in a conventional system and uses the internet in a IRLP or ECHOLINK system

In the last 15 years or so, additional tricks for 2M FM have come along. One of the earliest was the **Internet Radio Linking Project** or **IRLP**. The basic concept was to attach a computer and internet connection to the standard FM repeater. The system works much like a standard linked repeater system but the distance can be increased by inserting an internet bridge to carry the transmission instead of the airwaves. IRLP works, but the early versions often required some home made parts and generally needed a radio expert and a computer expert to get them to function. And there doesn't seem to have been much standardization. Getting the repeaters to talk to each other seems to have been kinda tricky.

IRLP showed promise, and was supplanted by and seems largely replaced by **ECHOLINK**. Echolink is simply a variety of VOIP, or IRLP,. Echolink is a worldwide network of linked repeaters. They all use the same standards and software and the system works well. To get started, you need to go to <http://www.echolink.org/>, download some software to your PC and register.



As part of the registration process you need to verify your Amateur Radio License by sending a PDF file of your Official FCC license (not a Reference Copy) to the ECHOLINK organization. For a lot more information, please see *VoIP: Internet Linking for Radio Amateurs* by Jonathan Taylor, K1RFD.

One of the neatest tricks of Echolink is that you need a ham radio license, but you do not need a ham radio! There is a free app for Iphone and a similar app for Android that you can download to your device. Once your device has been set up, it will communicate via the internet to the Node you selected, -for example the CARC two-meter net at 1900 Eastern Time on Sunday is Node 259045, and the station is AF3I-L. This is great for travelers and those who may be camping where they have internet access but the local repeater is not ECHOLINK equipped.

How does ECHOLINK work? The CARC two-meter net uses an ECHOLINK node. If you are local and if you have a radio, simply go to 146.490 MHz FM Simplex and you will hear the Net Control Station. When the net control asks for check-ins that is your cue to reply. The net control and other members using analog radios will hear you. The Echolink radio at AF3I will hear you and retransmit your signal over the internet to the check-ins who are using Echolink. If you are out of range, use the Echolink software or the Iphone or Android app to establish an ECHOLINK connection and your voice will travel over the internet to AF3I's computer. His computer will send your words to his Two Meter base station radio so that the analog users can hear you. Really slick!

Catch ~~ya~~ on the air!